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# PATENT SPECIFICATION

278,200

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## PROVISIONAL SPECIFICATION.

### Improvements in Flexible Disc Shaft Couplings.

We, HARDY, SPICER & COMPANY LIMITED, a British company, and EDWARD JOHN HARDY, a British subject, both of 118, Queen Victoria Road, Coventry, Warwickshire, do hereby declare the nature of this invention to be as follows:—

This invention relates to shaft couplings incorporating a flexible annulus, attached to spiders on the two shafts. Under certain conditions the annulus, or part of it, is liable to become temporarily eccentric and to cause vibration due to one or other of the shafts whirling.

To prevent this the one shaft is sometimes supported upon the other through the medium of a ball and socket joint. In one system there are used two loose centralising spiders clamped between the driving spiders and (through spacing washers) the usual plates which are attached to the annulus around the bolt holes, such centralising members engaging one another through the medium of a ball and socket and sliding joint formed on sleeve portions of the centralising members and located in the centre of the annulus.

The invention relates to couplings of this kind having centralising members, and its chief object is to provide a coupling member which is a unit ready for fitting directly to the driving spiders and capable of being fitted and removed radially without the necessity for drawing the spiders away from one another.

According to this invention, the sleeve portions above mentioned are carried by or integral with radial arms extending from the plates which are attached to the annulus at the bolt holes. These arms are preferably bowed away from the face of the annulus and may be flanged at the edges or ribbed or corrugated for strength.

In one construction, the coupling member is a flexible annulus of rubber and

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fabric in layers secured on the one side to one shaft through a three-armed spider, and on the other side to another shaft through a similar three-armed spider, as is usual. Frequently in such cases there is attached to the annulus at each bolt hole a triangular or sector shaped plate, which is generally riveted or otherwise fixed to the annulus. In carrying out the present invention, the three plates on the one side are connected together by radial arms which may be stiffened up by corrugating or flanging them in any desired manner, and these arms terminate in a sleeve which lies in the aperture in the annulus. For instance, a set of arms on one side of the annulus may be integral with a sleeve of comparatively large dimensions.

In a similar manner the three plates on the other side of the annulus may be integral with arms which are in one with a sleeve which lies within the first-mentioned one but with a substantial clearance therefrom. The sleeves are cylindrical and are coaxial with the pitch circle containing the bolt holes in the annulus, and the inner sleeve carries a bush of partially spherical shape, the centre of which lies on the centre of the disc. The periphery of this engages a bearing lining or bush inside the outer sleeve, and this second bush may be of any suitable type which does not require lubrication. For example, it may have sections of graphite let into the bearing surface.

By this means a unitary construction is produced which can be removed and fitted radially without disturbing the driving spiders.

Dated this 11th day of November 1926.

ERIC W. WALFORD,  
Fellow of the Chartered Institute of  
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19, Hertford Street, Coventry,  
Agent for the Applicants,

Price 3s. 0d.

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## COMPLETE SPECIFICATION.

## Improvements in Flexible Disc Shaft Couplings.

We, HARDY, SPICER & COMPANY LIMITED, a British company, and EDWARD JOHN HARDY, a British subject, both of 118, Queen Victoria Road, Coventry, Warwickshire, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

This invention relates to shaft couplings incorporating a flexible annulus, attached to spiders on the two shafts. Under certain conditions the annulus, or part of it, is liable to become temporarily eccentric and to cause vibration due to one or other of the shafts whirling.

To prevent this the one shaft is sometimes supported upon the other through the medium of a ball and socket joint. In one system there are used two loose centralising spiders clamped between the driving spiders and (through spacing washers) the usual plates which are attached to the annulus around the bolt holes, such centralising members engaging one another through the medium of a ball and socket and sliding joint formed on sleeve portions of the centralising members and located in the centre of the annulus.

The invention relates to couplings of this kind having centralising members, and its chief object is to provide a coupling member which is a unit ready for fitting directly to the driving spiders and capable of being fitted and removed radially without the necessity for drawing the spiders away from one another.

According to this invention, the sleeve portions above mentioned are carried by or integral with radial arms extending from the plates which are attached to the annulus at the bolt holes. These arms are preferably bowed away from the face of the annulus and may be flanged at the edges or ribbed or corrugated for strength.

In the accompanying drawings, Figure 1 is an elevation of one side of the disc showing the sleeve portions in position, and

Figure 2 is a section on the line II—II of Figure 1.

The coupling member is a flexible annulus 2 of rubber and fabric in layers

secured on the one side to one shaft (not shown) through a three-armed spider 3, and on the other side to another shaft (also not shown) through a similar three-armed spider 4, as is usual. Frequently in such cases there is attached to the annulus at each bolt hole 5 a triangular or sector shaped plate 6, which is generally riveted or otherwise fixed to the annulus. In carrying out the present invention, the three plates on the one side are connected together by radial arms 7 which may be stiffened up by corrugating or flanging them in any desired manner, as is shown for example at 8. These arms terminate in a sleeve 9 which lies in the aperture in the annulus. The set of arms on one side of the annulus may be integral with a sleeve of comparatively large dimensions.

In a similar manner the three plates on the other side of the annulus are integral with arms which are in one with a sleeve 10 which lies within the first-mentioned one but with a substantial clearance therefrom. The sleeves are cylindrical and are coaxial with the pitch circle containing the bolt holes 5 in the annulus, and the inner sleeve 10 carries a bush 11 of partially spherical shape, the centre of which lies on the centre of the disc. The periphery of this engages a bearing lining or bush 12 inside the outer sleeve, and this second bush may be of any suitable type which does not require lubrication. For example, it may have sections 13 of graphite let into the bearing surface, or it may have lubrication by oil, grease, or other known method.

Between the plates 6 and the sleeves 9 and 10 the arms 7 are preferably bowed leaving a space such as 14 between them and the annulus 2, thus avoiding any restraint of the latter's movements when the connected shafts tilt relatively to one another.

By this means a unitary construction is produced which can be removed and fitted radially without disturbing the driving spiders.

Having now particularly described and ascertained the nature of our said invention and in what manner the same is to be performed, we declare that what we claim is:—

1. A shaft coupling of the kind

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referred to, in which the sleeves supporting the centralising members are carried by or integral with radial arms extending from plates attached to the annulus at the bolt holes, substantially as and for the purpose described.

2. A shaft coupling as claimed in Claim 1, in which the radial arms are bowed away from the surface of the annulus, and preferably are stiffened, as by corrugations or by forming ribs at their edges, substantially as and for the purpose described.

3. A shaft coupling as claimed in Claim 1 or Claim 2, in which the sleeves are supported by arms extending from the plates at each bolt hole in the annulus, substantially as described.

4. A shaft coupling as claimed in any of the preceding claims, in which the sleeves are arranged one within the other, and the inner carries a bush of part spherical shape which engages the outer sleeve and has its centre on that of the disc, substantially as described.

5. The complete shaft coupling, substantially as described or as illustrated in the accompanying drawings.

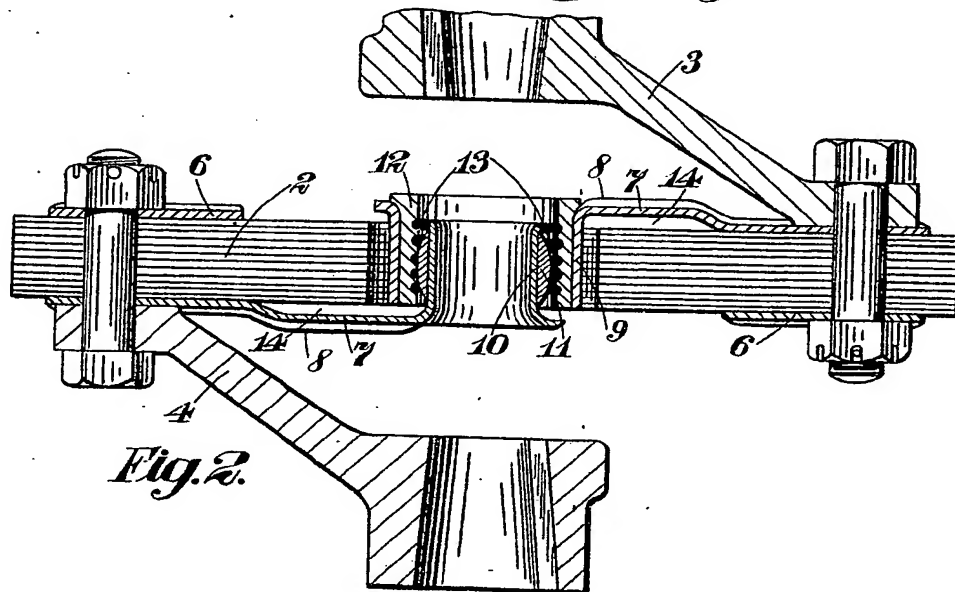
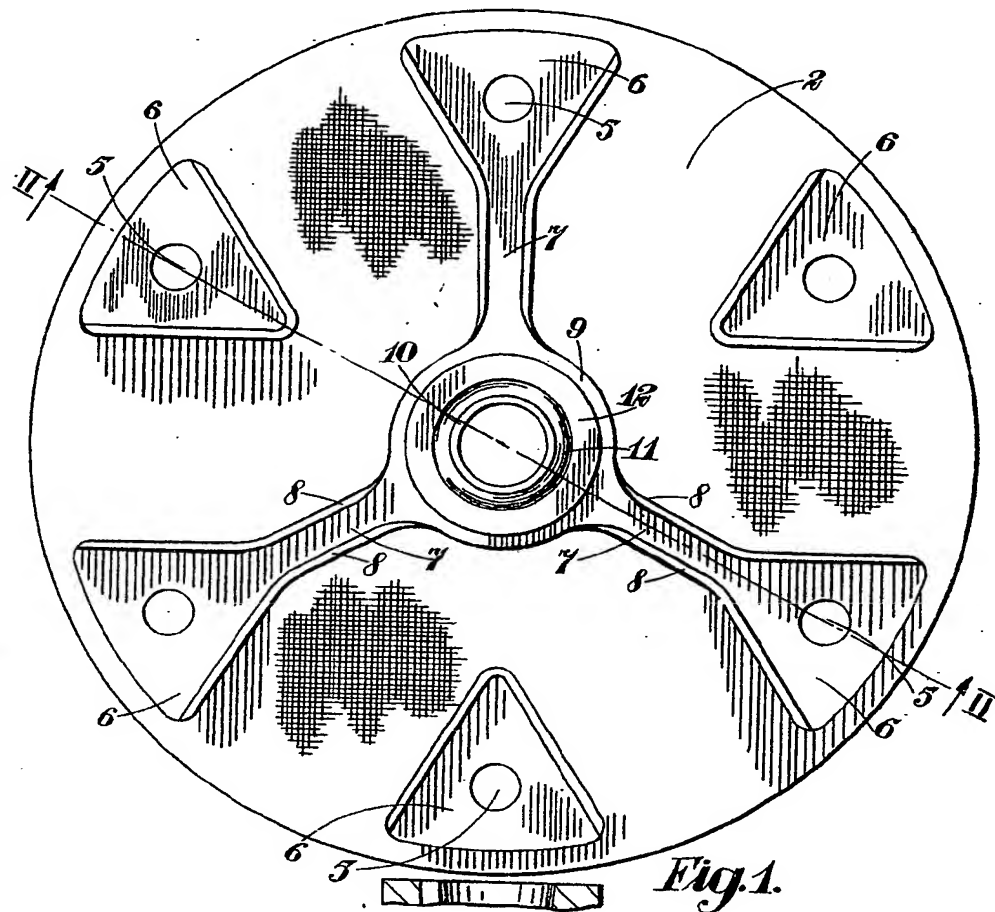
Dated this 25th day of July, 1927.

ERIC W. WALFORD,  
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*[This Drawing is a reproduction of the Original on a reduced scale.]*



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